Bo HV Supply and Lead

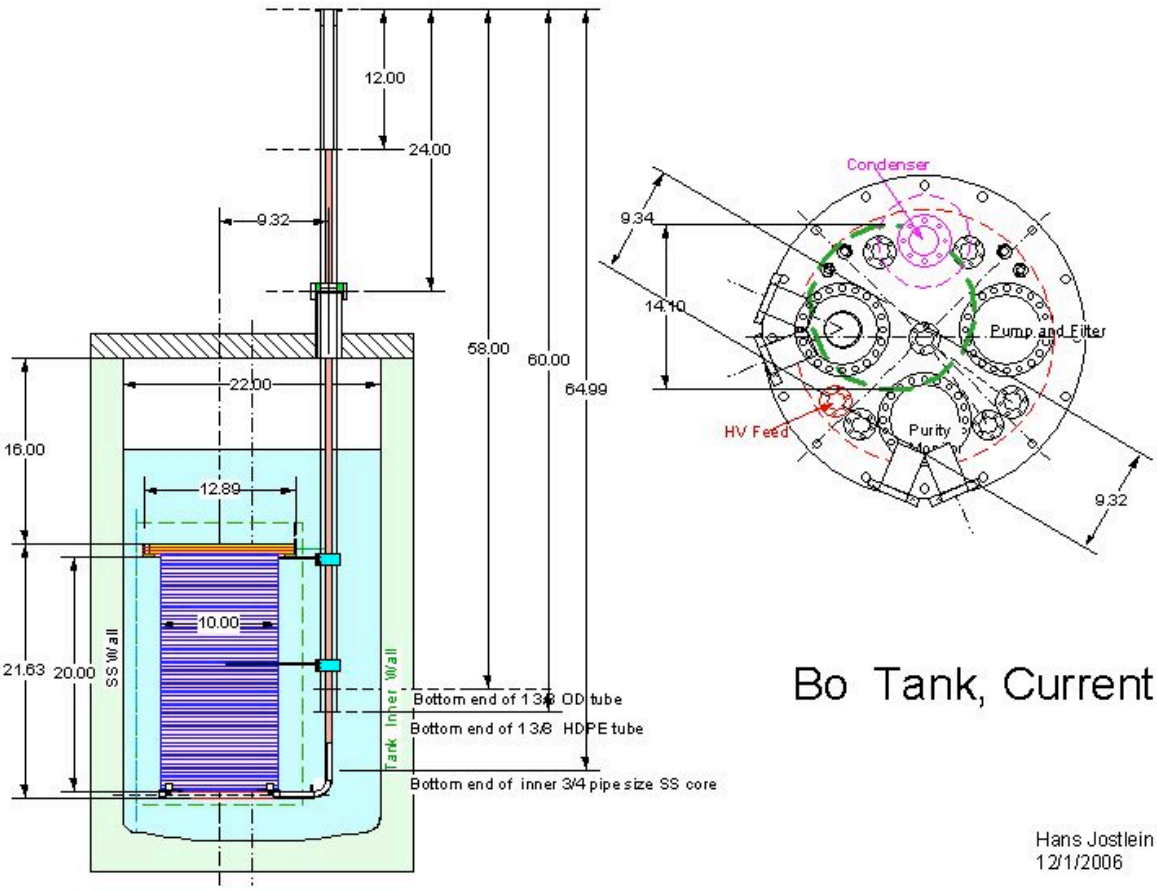
Hans Jostlein, March 30, 2007

Abstract

We have built and tested a noise filter and HV lead for the Bo TPC.
The system performs up to 100 kV, where the requirement is for 25 kV.
Future R&D will be needed to extend the HV operating range for larger drift distances.

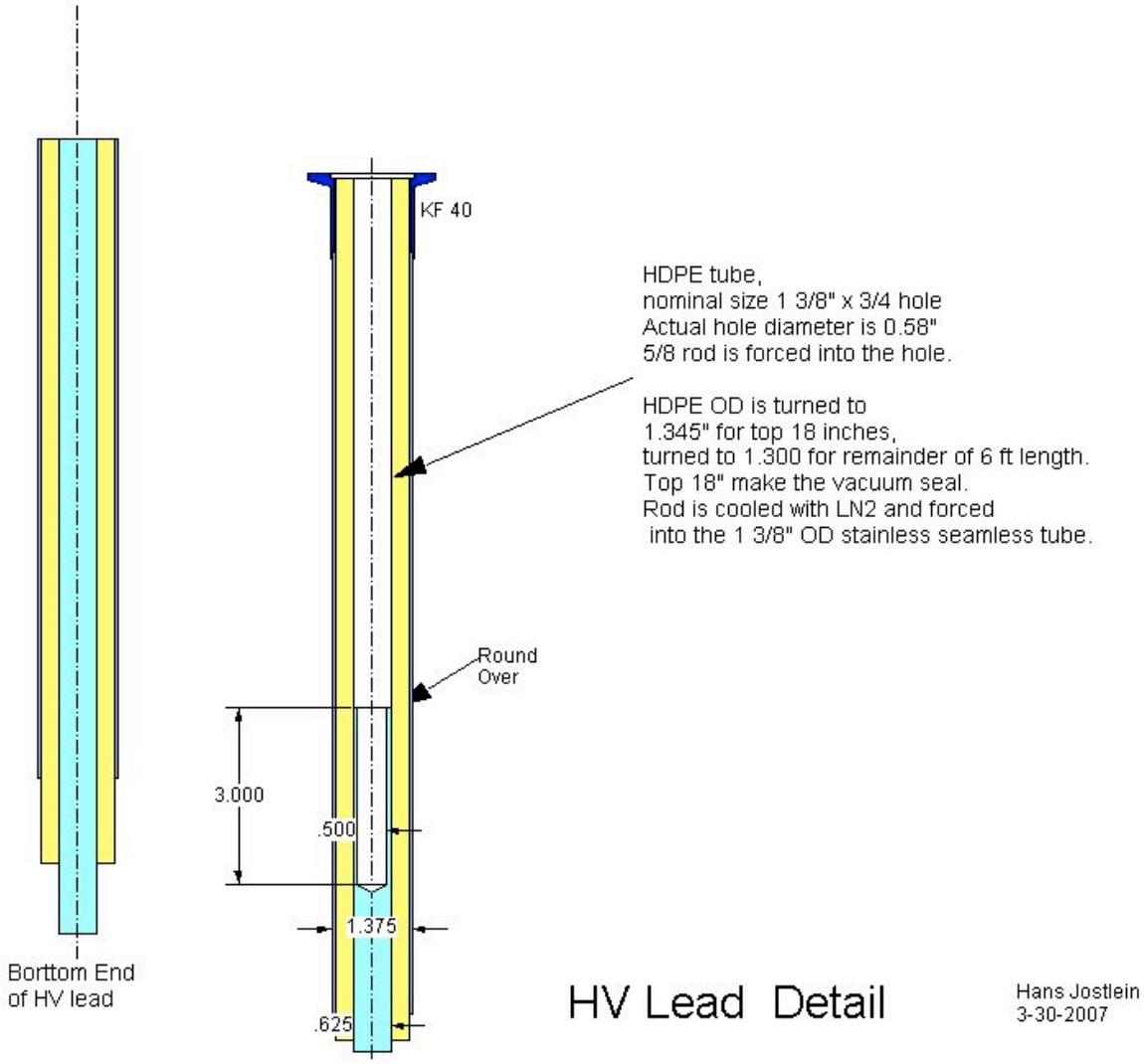
Introduction

The TPC being built for the “Bo” cryostat is shown below:

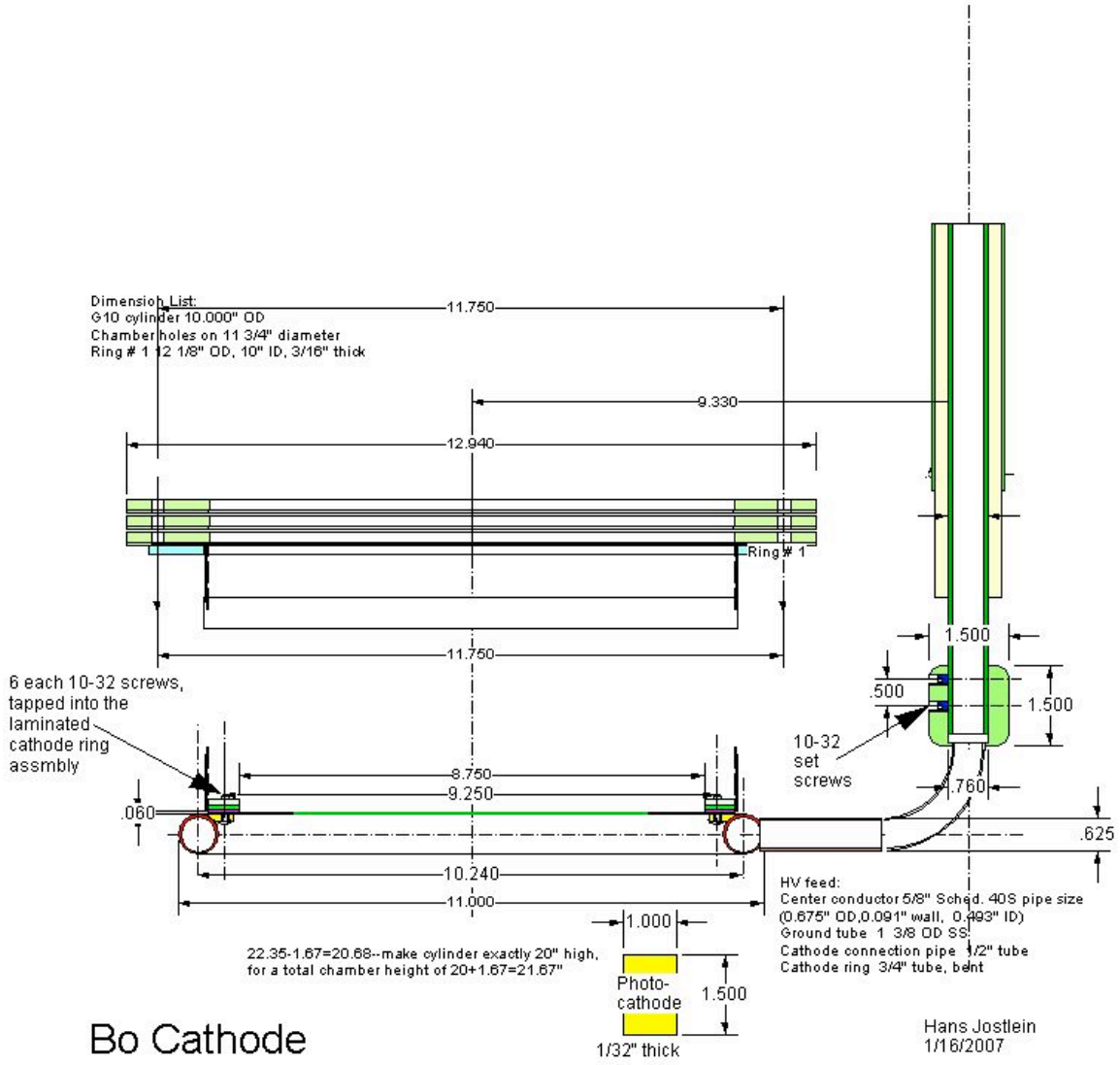


This note describes the HV lead design, the HV filter, and results of a HV test done on 3/30/2007

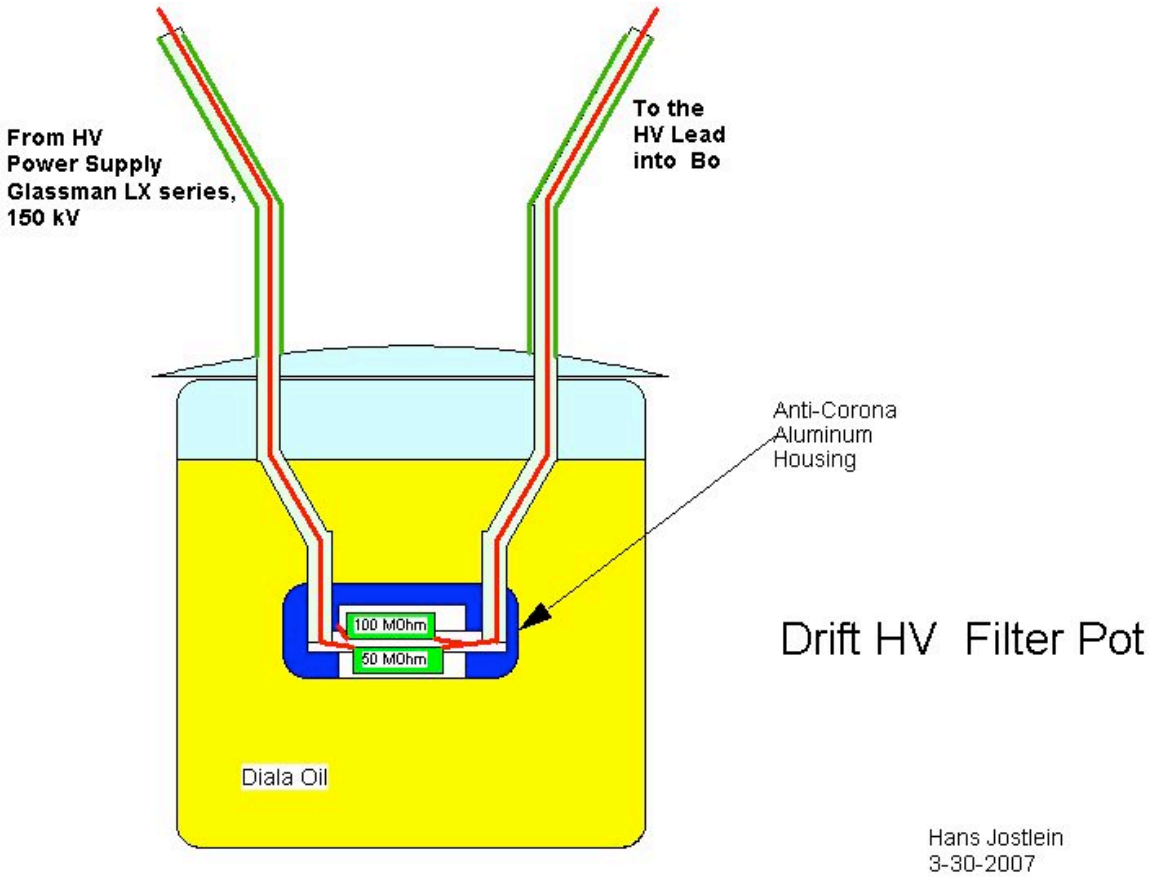
The HV Lead for Bo



The Bo Cathode HV Connection



The HV Filter Pot



Test results

We have tested the HV lead, connected to the Glassman HV supply via the filter pot, for a HV test in LN2.

An initial test with the lead in air, and the HV filter pot filled with air (not the Diala oil) showed breakdown at 32 kV. This compares to the nominal drift HV need for BO of 25 kV.

After filling with LN2 and oil, we reached a maximum of 132 kV before breakdown. After the initial breakdown, the system held 100 kV, but not 110 kV.

Conclusion

The existing HV lead, filter pot, and cables are adequate for operation of Bo.
For operation at 2.5 m drift, e.g. in the LAr purity demonstration TPC , a voltage of 125 kV will be needed, and some more R&D work needs to be done to identify the breakdown area and improve the HV capability.